

Sedimentary Rocks Cont.

Woolsey Shale

As you head west from the park's entrance into the Jefferson Canyon there are large fins of rock on the north side of Highway 2. These are Woolsey Shale. It is a localized shale and has a greenish to gray color.

Flathead Sandstone

This is another arkosic sandstone that almost resembles quartzite. In the park it tends to a drab tan coloration. There are some exposures on the hills just west of the DanMor Gypsum Mine.

Igneous Rock

Volcanic Rock

Elkhorn Andesite

Throughout the faults of the London Hills there are intrusions and "pipes" of igneous rock, but the only type readily seen at the surface is the Elkhorn Andesite seen mainly just north of the Campground and Main Visitor Center. This rock is a greenish gray porphyry with cylindrical hornblende flecks giving the rock black spots. It has a grainy texture and these black cylinders help differentiate it from the arkosic sandstones.

Park Rock Timeline

Oldest to youngest

Precambrian: Lahood Formation

Cambrian: Meagher Limestone

Flathead Sandstone

Pilgrim Formation

Woolsey Shale

Devonian: Jefferson Dolomite

Three Forks Shale

Mississippian: Madison Limestones

Pennsylvanian: Amsden Formation

Jurassic: Morrison Gypsum

Cretaceous: Elkhorn Andesite

Practice Leave No Trace:

Montana State Parks is a proud partner with the Leave No Trace Center for Outdoor Ethics.

Please leave rocks and minerals as you find them for future users to enjoy.

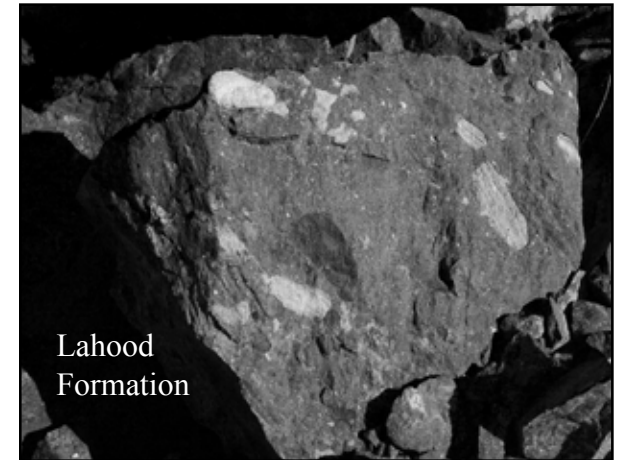
Enjoy rocks you find on the surface, but please refrain from digging into the ground or rock outcrops.

Many of the rocks in the park are fragile and tend to crumble or break under duress. Handle all minerals with care and avoid climbing or scrambling on unstable rock outcrops.

Please remember to let park staff know of any unusual observations so that we may improve this list.



Lewis & Clark Caverns State Park Rock List



Lewis & Clark Caverns State Park features unique geology that is often accessible right at the surface. The cave itself is a geological wonder, but the rest of the park features exposures of many types of rock and interesting features such as distinct visible faults. Universities from across the United States come to study the interesting and unique geology of the Park and the surrounding London Hills.



Sedimentary Rocks

The Madison Limestone Group

Mission Canyon Limestone

Mission Canyon Limestone is an excellent form of limestone for cave formation and Lewis & Clark Caverns exists in this layer. It has massive (4' to 20') bedding planes also called beds. These thick beds are also nearly pure calcium carbonate. These two physical features allow for excellent cave formation. Mission Canyon Limestone is pale gray in color and makes up the upper part of cave mountain behind the Cave Visitor Center.

Lodgepole Limestone

The bottom section of the Madison Limestone is more shaley and silacious with a dark gray color. Unlike the Mission Canyon Limestone it rarely features caves and has thin beds, often only a couple of inches thick. The cliffs along the north edge of the parking area are Lodgepole Limestone.

Charles Limestone

The top layer of the Madison Limestone group is rarely seen as it erodes away rapidly upon surface exposure. There are no known exposures in the park.

Butterscotch Chert

This gray to burnt orange chert is found both as beds and nodules within the two main layers of the Madison Limestone. It is harder than the limestone and often very smooth and can have very sharp edges. Stone age peoples around the world used chert for cutting tools and edged weapons.

Sedimentary Rocks Cont.

Belt Series Rocks

LaHood Formation

Course grained arkosic sandstone. The grains are strongly cemented together due to the slight metamorphic nature of this rock. It sometimes has larger cobbles and more of a conglomerate nature. One cobble near the park's west boundary is nearly the size of a washing machine. The Lahood formation ranges from rusty red to dark green-gray. This is the oldest rock in the park and may be over 1 billion years old in places. The highway along the west part of the park is one of the best places to see Lahood Formation, especially in its conglomerate form.

Other Sedimentary Rocks

Morrison Gypsum

Small amounts of this mineral can still be found in the open pit that was the DanMor Gypsum Mine. It is powdery and often appears crystalline. .

Meagher Limestone

From the distance this pale rock looks much like the Mission Canyon Limestone, but is much more crumbly and pockmarked. There is a large cliff of this on the eastern park boundary above the East Side Trail.

Sedimentary Rocks Cont.

Pilgrim Formation

Another inconsistent rock that contains limestone and turns to dolomite in the upper sections. Often brown-gray in color you can view this rock best looking east from the cave visitor center toward the cell tower atop the hills. It is the high point of the London Hills north of the Jefferson River.

Jefferson Dolomite

A very crumbly gray dolomite that is similar to the limestone, but has a grainier texture. The small mountain behind the cafe/giftshop consists almost entirely of Jefferson Dolomite. Small caves also form in this rock type

Three Forks Shale

A very limey shale that occurs directly beneath the lodgepole limestone. Trilobite fossils have been found in this rock at other locations. It tends to be tanner in color than the limestones. Three Forks shale is softer as well and the Cave Visitor Center's parking area sits atop this shale where it eroded away, creating a saddle.

Amsden Formation

The red cliff bands in the western part of Jefferson Canyon are Amsden formation. It is a strange rock that includes sandstone, dolomite, cherty shale sections and even some limestone. The overall character varies from one layer of this rock to another.